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ABSTRACT

This instructional package contains two plant life units developed for the Dade County Florida Quinmester Program. "Plant Life in the Backyard" introduces the student to the more familiar plants in South Florida. Emphasis is placed on the economic value of local plants, plant propagation, and photosynthesis. "The Green Plant" is an introduction to the anatomical, morphological, physiological and biochemical concepts applicable to a green plant. Each booklet includes performance objectives for the unit, lists state-adopted texts, provides a synoptic summary of the course content, suggests activities and projects, indicates audio-visual materials available in the county and from other sources, and recommends reference books. Each booklet contains a chart relating each suggested activity to specific performance objectives. (CP)

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# AUTHORIZED COURSE OF INSTRUCTION FOR THE QUINMESTER PROGRAM

DADE COUNTY PUBLIC SCHOOLS

SCIENCE

The Green Plant

(Experimental)

5314.12

DIVISION OF INSTRUCTION • 1971

# THE GREEN PLANT

5314.12

SCIENCE

(Experimental)

Written by James F. Miley and Peter Stamos
for the
DIVISION OF INSTRUCTION
Dade County Public Schools
Miami, Florida
1971

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THE GREEN PLANT

COURSE DESCRIPTION

An introduction to the anatomical, morphological, physiological and biochemical concepts applicable to a green plant. Identification and study will be made of some green plants indigenous to South Florida.

The theme of the course is centered around laboratory activities and supported by projects, reports, field trips, speakers and audio-visual methods.

ENROLLMENT GUIDELINES

This course is part of the basic biology block needed by serious biology students.

STATE ADOPTED TEXTS

1. Smallwood, William L. Biology. Morristown, N. J.: Silver Burdett Co., 1971.

2. Biological Sciences Curriculum Study. Biological Science - Molecules to Man, 2nd Ed.. Boston: Houghton-Mifflin Co., 1968.

3. Biological Sciences Curriculum Study.. High School Biology: BSCS Green Version, 2nd Ed.. Chicago: Rand, McNally and Co., 1968.

4. Biological Sciences Curriculum Study.. Biological Science-An Inquiry Into Life, 2nd Ed. New York: Harcourt, Brace and World, Inc., 1968.

PERFORMANCE OBJECTIVES

1. Given the diagram of a plant and an animal cell, the student will contrast the distinguishing characteristics of a plant cell.

2. Given a typical plant cell with the parts identified, the student will state the functions of each labeled part.

3. From two groups of different kinds of plants, the student will distinguish the characteristics of a unicellular and a multicellular plant.

4. Students will identify non-vascular plants by selecting those plants without roots, stems, or leaves.

5. Students will describe the three major parts of a vascular plant.

6. Given a vascular plant students will dissect it, in order to identify the five specialized tissues.

7. Given a cross-section of a leaf, student will identify all the structures necessary for photosynthesis.

8. Students will analyze what happens during the light reaction in photosynthesis and during respiration.

9. Students will design an experiment to investigate photosynthesis.

10. Students will devise a method utilizing apparatus to show the importance of mineral nutrition and water transport in a green plant.

11. Students will differentiate between asexual and sexual reproduction.

12. Students will discover the sequence of sexual reproduction in a green plant.

13. Students will prepare a tissue culture in order to recognize and examine differentiation in morphogenesis.

14. Students will design and do investigations in each of the following four regulators of growth: hormones, growth inhibitions, tropisms and external influences.

15. Given a selected group of South Florida plants, students will identify those plants found on inland waterways, swamps, seashore, wood and field.

COURSE OUTLINE

I. The Green Plant Cell

A. Cellular structures
1. Cell wall
2. Cell substances
a) Nucleus
b) Chlorplast
c) Mitochondria
d) Cytoplasm
3. Vacuoles

II. Plant Structure

A. Nonvascular
1. Unicellular and multicellular
2. No roots, leaves or stems

B. Vascular
1. Multicellular
2. Roots, leaves and stems
3. Specialized tissues
a) Meristematic
b) Protective
c) Parenchyma
d) Supporting
e) Conductives

III. Plant Development

A. Plant Nutrition
1. Photosynthesis
2. Mineral nutrition
3. Water transport and utilization

B. Plant Growth
1. Reproduction
a) Asexual
b) Sexual
2. Differentiation
3. Growth regulators
a) Hormones
b) Growth inhibitors
c) Tropisms
d) External influences

IV. Plant Habitats of South Florida

A. Inland waterways and swamps
B. Seashore
C. Woods and fields

LABORATORY EXERCISES

Galston, Arthur W. The Green Plant. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1968.

1. Five exercises: Culture of excised roots, stems, leaves, callous tissue, and single cells. (pp. 81-88)

Jacobs, William P. and Lamotte, Clifford E. Regulation in Plants by Hormones. Boston, Mass: D. C. Heath & Co., 1964.

3. A Plant Cell: Anacharis (Ex. 4, p. 17)
4. Separation of Plant Pigments (Ex. 7, p. 27)
5. Carbon Dioxide and Photosynthesis (Ex. 32, p. 135)
6. Leaf structures-Stomates (Ex. 33, p. 139)
7. Transpiration (Ex. 34, p. 143)
8. Alternations of Generations (Ex. 14-1, p. 90)
9. Enzyme Activity in Plants (Ex. 35, p. 149)

Abramoff, Peter, and Thompson, Robert C. Investigations of Cells and Organisms - A Laboratory Study in Biology. Englewood Cliffs, N. J. : Prentice-Hall, Inc. 1968.

10. Reproduction in Algae (Ex. 68, p. 216)
11. Reproduction in Mosses (Ex. 69, p. 220)
12. Reproduction in Ferns (Ex. 70, p. 222)
13. In What Part of the Plant Does Growth Occur? (Ex. 47, p. 148)
14. Cell Structure - Onion Cells (Ex. 5, p. 18)
15. Cell Structure - Elodea Cells (Ex. 6, p. 20)
16. Is Light Necessary for Photosynthesis? (Ex. 19, p. 60)
17. How Does Light Intensity Affect the Rate of Photosynthesis? (Ex. 20, p. 62)
18. How Can you Determine if Chlorophyll is Necessary for Photosynthesis? (Ex. 22, p. 66)
19. How Can $O_2$ Consumption in Respiration be Measured? (Ex. 28, p.84)
20. How Can $CO_2$ Production During Respiration be Measured? (Ex. 29, p. 87)
21. What is the Effect of Various Environmental Factors on Transpiration? (Ex. 31, p. 96)
22. How Can the Movement of Minerals in Plants be Measured? (Ex. 32, p. 99)
23. Anatomy of the Root (Ex. 4, p. 132)
24. Anatomy of the Stem (Ex. 43, p. 133)
25. Anatomy of the Leaf (Ex. 44, p. 138)
26. The Animal Welfare Institute. Humane Biology Projects. 22 E. 17 Street, New York 3, N. Y.: Animal Welfare Institute, 1960. Plant Physiology - (17 experiments, pp. 35-40)

Biological Sciences Curriculum Study. Research Problems in Biology: Investigations for Students, Series Two. Garden City, New York: Anchor Books, Doubleday and Co., Inc., 1963.

27. Nutrition on Excised Plant Tissues and Organs (pp. 203-208)

Biological Sciences Curriculum Study. Biological Science - Molecules to Man, 2nd Ed. Boston: Hougton-Mifflin Co., 1968.

28. Investigating Photosynthesis (Ex. 7-5 p. 168)
29. Investigating Production of a Carbohydrate by Plants (Ex. 7-6, p. 170)
30. Investigating the Effects of Varying Light Intensity on the Rate of Photosynthesis (Ex. 7-8, p. 174)
31. Investigating Chlorophyll Pigments (Ex. 7-14, p. 187)
32. Investigating the Effect of Oxygen on Cell Growth (Ex. 8-3, p.198)
33. Investigating Chemical Breakdown of Sugar (Ex. 8-6, P. 203)
34. Investigating the Relationship Between Diffusion and Cell Size (Ex. 11-2, p. 265)
35. Investigating Cell Division (Ex. 11-5, p. 270)
36. Investigating Development of the Plant Embroyo (Ex. 4-2, p. 342)
37. Investigating Transport in Plants (Ex. 18-5, p. 474)
38. Investigating Reproduction in Flowering Plants (Ex. 13-6, p. 306)
39. Investigating the Influence of Heredity and Environment in Plant Pigmentation (Ex. 15-3, p. 377)
40. Investigating Movement in Plants (Ex. 25-2, p. 630)

Biological Sciences Curriculum Study. Biological Science An Inquiry Into Life, Student Laboratory Manual. New York: Harcourt, Brace and World, Inc., 1968.

41. Cork-An Investigation into Form and Function (Ex. 3-1, p. 23)
42. Cells of Living Plants (Ex. 3-2 A & B, p. 25)
43. Comparison of Plants - Simple or Complex (Ex. 13-1, p. 85)
44. Green Algae-Simple and Complex (Ex. 13-2, p. 89)
45. Alternation of Generations (Ex. 14-1, p. 90)
46. A Primitive Vascular Plant (Ex. 14-2, p. 92)
47. Leaf Structure and Function (Ex.15-2, P. 97)
48. Stems (Ex. 16-1, p. 104)
49. Roots (Ex. 16-2, p. 105)
50. The Gateway Into a Leaf (Ex. 15-6, p. 102)
51. Transpiration in Plants (Ex. 16-3, p. 107)
52. The Significance of Leaf Color (Ex. 15-1, p. 96)
53. The Pigments In A Leaf (Ex. 15-3, p. 98)
54. Light and Leaves (Ex. 15-4, p. 100)
55. Plants and Air (Ex. 15-5, p. 101)
56. The Importance of Seeds (Ex. 14-3, p. 94)
57. Flowers (Ex. 17-1, p. 110)
58. From Seed to Seedling (Ex.17-3, p. 117)
59. Plant Reaction to Environment (Ex. 17-4, p. 119)
60. Regulation of Growth in Plants (Ex. 17-5, p. 121)

Biological Sciences Curriculum Study, High School Biology: BSCS Green Version, 2nd Ed. Chicago: Rand, McNally & Company, 1968.

61. The Concept of Primitive Characteristics (Ex. 5-2, p. 179)
62. Vegetative Reproduction (Ex. 16.1, p. 582)
63. A Model of Meiosis (Ex. 16-2, p. 589)
64. Diversity in All Structures (Ex. 11.1, p. 385)
65. Diffusion Through a Membrane (Ex. 11.2, p. 388)

66. Mitosis and All Division in Plant Cells (Ex. 11.3, p. 397)
67. Transpiration (Ex. 13.1, p. 448)
68. Stomata and Photosynthesis (Ex. 13.2, p. 450)
69. Separation of Leaf Pigments (Ex. 12.4, p. 429)
70. Photosynthetic Rate (Ex. 12.5, p. 439)

Lawson, Chester A., (editor). Laboratory and Field Studies in Biology-A Source book for Secondary Schools. New York: Holt, Rinehart and Winston, Inc., 1960.

71. Study of A Forest Community (Section I, Topic A, Study 1, p. 3)
72. Introduction to Asexual Reproduction in Plants through a Field Trip (Section VI, Topic A, Study 6, p. 314)
73. Do Plants Respond to their Environment (Sec. V, Topic 9, Study 9, p. 285)
74. Auxin as a Correlator of Plant Behavior (Section V, Topic 6, Study 10, p. 289)
75. Plant Hormones: Do They Regulate Growth of Plants (Section V, Topic 6, Study 11, p. 291)
76. What is the Effect of Temperature on the Growth of Small Grains? (Section V, Topic 6, Study 12, p. 293)
77. Where Does the Plant get Material for Growth? (Sec. IV, Topic A, Study 3, p. 99)
78. Photosynthesis (Sec. IV, Topic A, Study 5, p. 105)
79. Photosynthesis and the splitting of water (Sec. IV, Topic A, Study 6, p. 109)
80. The Importance, Characteristics, and Composition of Chlorophyll (Sec. IV, Topic A, Study 7, p. 111)
81. Respiration in Plants, Animals and Microorganisms (Sec. IV, Topic B, Study 7, p. 137)

DEMONSTRATIONS

1. Suspend a bryophyllum leaf: Growth will occur in the indentation of the leaf margin.

2. Agriculture Research Service, U. S. Department of Agriculture. Light and Plants. Miscellaneous Pub. #879, Washington, D. C., Superintendent of Documents, 1961, p. 26.

3. The cohesion tension theory with capillary tubes.

PROJECTS

1. Model of plant cell mitosis and meiosis.
2. Model of plant cohesion tension theory with capillary tubing.
3. Investigation of possible interactions between algae and bacteria during growth.
4. Vegetative propagation.
5. Variation in the size of pollen cells.
6. The time of most active cell division in root tips of plants.
7. The effects of age on growth and development of vegetatively propagated plants.
8. Illustrate the sequence of sexual reproduction using living plants, i.e., orchids.
9. Take pictures of the sequence of sexual reproduction in the green plant.
10. Construct a model depiciting the sequence of sexual events in green plants.
11. Make a series of transparencies showing the series of green plant reproduction.
12. Study of the effects of anticancerous agents on plant callus and tumor tissues.
13. Nutrition of excised plant tissues and organs.
14. Factors influencing plant tumor growth.
15. Antagonistic effects of 2, 4, dinitrophenol on growth abnormalities induced by 2, 4-D.
16. Effects of plant growth regulators on reproductive organs and accessory floral organs.
17. The modification of juvenile and adult leaf forms with plant growth regulators.

REPORTS

1. Fresh water algae of Florida.
2. Seaweeds and their uses.
3. Mosses: The link between green algae and vascular plants.
4. Differences between vascular and nonvascular plants.
5. Differences between plant and animal cells.
6. Functions of the five kinds of specialized tissues found in vascular plants.
7. The part that minerals play in plant nutrition.
8. The Life of William J. Robbins.
9. Crown galls.
10. The kinetics of growth.
11. Plant light - growth discoveries: From photoperiodism to phytochrome.
12. Plants for survival.
13. Native shrumbs of South Florida.
14. The Everglades.
15. Seminole Bread.

FIELD TRIPS

1. Fairchild Gardens
2. Everglades National Park
3. Tamiami Canal
4. Matheson Hammock
5. Shaw's Nursery
6. Agricultural Research and Education Center of the University of Florida's Institute of Food and Agricultural Science (formerly Sub-Tropical Experimental Station) Homestead, Florida
7. Plant Introduction Station (Old Cutler Road)
8. Redlands Fruit and Spice Park
9. Bear Cut
10. Greynolds Park
11. Museum of Science Nature Trails

SPEAKERS

1. Dr. Robert Conover
   Agricultural Research and Education Center of the University of Florida's Institute of Food and Agricultural Science
   Homestead, Florida

2. Dr. Julia Morton
   Morton Collectanea
   University of Miami

3. Dr. Taylor Alexander
   Biology Department
   University of Miami

4. Dr. John Popenoe
   Fairchild Tropical Garden

5. Mrs. Patti Amon
   Dade County Parks

6. Dr. Monroe Birdsey
   Biology Department
   Miami-Dade Junior College - South

## FILMS

Educational Media Center, F.S.U., Tallahassee, Florida 32306
(Rental charge for films)

1. Bryophytes, 29', C, McGraw-Hill ($7.95)
2. Algae, 29', C, McGraw-Hill ($7.95)
3. Simple Plants: Algae and Fungi, 13', C, Coronet ($4.00)
4. Algal Reproduction, 29', C, McGraw-Hill ($7.95)
5. Life Cycle of a Plant, 11', BW, UW ($2.00)
6. Plant Reproduction, 29', C, McGraw-Hill ($7.95)
7. Plant Growth and Development, 29', C, McGraw-Hill ($7.95)
8. Root Development, 10', BW, UW ($2.00)

## DADE COUNTY 16MM FILMS

9. Reproduction in Plants
   AV# 1-11051, 14', C
10. Algae
    AV# 1-1111-7, 16', C
11. Lichens and Mosses
    AV# 1-11113, 22', C
12. Growth of Seeds
    AV# 1-11103, 14', C
13. Plant Growth
    AV# 1-02273, 10', BW
14. Seeds and Germination (AIBS, Pt3. No. 2)
    AV# 1-31540, 28', C
15. Diversities and Similarities of Plants (AIBS, Pt 7 #12)
    AV# 1-31536
16. Adaptions in Plants
    AV# 1-11059, 15', C
17. Adapting to Changes in Nature
    AV# 1-01359, 11', C
18. Carnivorous Plants
    AV# 1-02323, 10', BW
19. Chlorophyll (photosynthesis)
    AV# 1-30628, 28', C
20. Growth of Flowers
    AV# 1-02354, 11', C
21. Growth of Seeds
    AV# 1-11103, 11', C
22. Life of a Plant
    AV# 1-00269, 10', C
23. Osmosis
    AV# 1-11094, 14', C
24. Plant Growth
    AV# 1-02273, 10', BW
25. Plant Growth and Development
    AV# 1-30639, 28', BW
26. Plant Life at Work
    AV# 1-02280, 10', C
27. Plant Reproduction
    AV# 1-30649, 28', C

28. Plant Traps
AV# 1-02327, 11', C
29. Plants Make Food
AV# 1-02287, 11', C
30. Plants Obtain Food
AV# 1-11100, 15', C
31. Plant Organism
AV# 1-31538, 28', C
32. Plants of the Desert
AV# 1-02329, 7½', C
33. Plants That Grow from Leaves, Stems and Roots
AV# 1-02314, 11', C
34. Reproduction in Plants
AV# 1-11051, 14', C
35. Roots of Plants
AV# 1-02320, 11', C
36. Seasonal Changes in Plants
AV# 1-02331, 10', C
37. Secrets of Plant World
AV# 1-11096, 13', C
38. Seeds Grow Into Plants
AV# 1-02296, 10', C
39. Seed Germination
AV# 1-11104, 14', C
40. Simple Plants: Algae and Fungi
AV# 1-11115, 14', C
41. Simple Plants: Bacteria
AV# 1-11120, 14', C
42. Stems (A.I.B.S.PT. 3, No. 7)
AV# 1-12496, 28', BW
43. Trees: Our Plant Giants
AV# 1-11109, 14', C
44. What Plants Need for Growth
AV# 1-02312, 10', C
45. Wonders of Plant Growth
AV# 1-02305, 11', BW
46. Seeds and Germination (AIBS, pt. 3, No. 2)
AV# 1-31540, 28', C
47. Leaves
AV# 102262, 10', BW
48. Leaves
AV# 130474, 28', C
49. Cell, Structural Unit of Life
AV# 1-02231, 10', C
50. Cell Biology Part 1 Unit of Life #2
AV# 1-30525, 30', C
51. Cell Biology Part 1 What is a Cell? #3
AV# 1-30526, 30', C
52. Carbon 14
AV# 1-01926, 12', BW

FILM LOOPS

1. Cytoplasmic Streaming in Plant Cells (Ealing 81-5381)
2. The Importance of the Nucleus (Ealing 81-5936)
3. Measuring Rate of Photosynthesis (Ealing 81-6033)
4. Photosynthesis Fixation of $CO_2$ (Ealing-Part 1 81-5118, Part 2 81-5126)
5. Phototropic Response in Coleoptiles (Ealing 81-5746)
6. Regulation of Plant Development. Coleoptile Response in ZEA: Part I (Ealing 81-51 34)
7. Regulation Plant Development: Coleoptile Response in ZEA Part 2 (Ealing 81-5142)
8. The Dividing Cell (Ealing 81-5142
9. Plant Reproduction (Ealing 89-1655 - SET)

DADE COUNTY AUDIO-VISUAL SLIDES

1. Everglades National Park (C) 2 x 2 slides in magazine AV# 5-20095, 14 slides
2. Plants and Trees, (C), 2 x 2 slides in magazines AV# 5-20046, 32 slides
3. Subtropical Flowering Plants (Part 1), (C), 2 x 2 slides in magazines, AV# 5-20074, 26 slides, SG
4. Subtropical Flowering Plants (Part 2), (C), 2 x 2 slides in magazines, AV# 5-20074, 26 slides, SG
5. Subtropical Flowering Plants, (C), 2 x 2 slides in magazines AV# 5-20067, SG
6. Trees and Flowering Plants, (C) 2 x 2 slides in magazine, AV# 5-20001, 30 slides
7. Flowering Plants: set 4 (C) 25 slides AV# 5-00007
8. Flowers Set 1 (C) 30 slides AV# 5-20080
9. Flowers Set 2 (C) 34 slides AV# 5-20077
10. Plants Set 1 (C) 25 slides AV# 5-00013
11. Structure of the Flower (C) AV# 5-30026

DADE COUNTY AUDIO-VISUAL FILM STRIPS

12. Roll Call of the Plants 38 Frame (C) AV# 573
13. How Hormones Regulate Plant Growth AV# 587, 40 Frames (C)

DADE COUNTY TRANSPARENCIES

1. Fungus Plants, The
   AV# 2-00025 BW
2. Plant Structure
   AV# 2-00022 1 BW
3. Angiosperm, Leaf Plant Factory
   AV# 2-00079 C
4. Angiosperm, Root
   AV# 2-00081 C
5. Angiosperm, Stem (Support and Circulation)
   AV# 2-00080 C
6. Herbaceous Dicot Stem
   AV# 2-00168 BW
7. Mitotic Cell Division
   AV# 2-00008 C
8. Monocot Stem Structure
   AV# 2-00006 BW
9. Structure of the Leaf
   AV# 2-00004 BW
10. Structure of the Leaf
    AV# 2-00170 BW

TRANSPARENCIES TO BE PURCHASED FROM SCIENCE KIT CO.

11. 3 - 6 Reproduction of Cells
12. 3 - 7 Asexual Reproduction of Molds
13. 3 - 13 Protococcus - A Common Green Algae
14. 3 - 14 Spirogyra - A Filamentous Green Algae
15. 3 - 15 Sexual and Asexual Reproduction
16. 3 - 24 Life Cycle of a Moss
17. 3 - 25 Life Cycle of a Fern
18. 3 - 26 Plant Body of a Flowering Plant
19. 3 - 29 Root Tissues
20. 3 - 39 Flower Reproduction

## SUGGESTED DISCUSSION QUESTIONS

1. What characterizes a unicellular, green plant?

2. What characterizes a multicellular green plant?

3. Correlate algae, brophytes, tracheophytes, gymnosperms, and angiosperms using unicellular-multicellular as a frame of reference.

4. Where did multicellular plants come from?

5. Describe budding as a method of plant propagation.

6. What indigenous plant life might be used to augment the diet as well as meet many other human needs?

7. What are the food habits of the Seminoles and other people of Dade County using a group of South Florida plants as a frame of reference?

8. What are characteristics and typical examples of the following groups of plants:
   a. "Plants of the seashore"
   b. "Plants of inland waterways and swamps"
   c. "Plants of woods and fields"

9. Discuss the type of plant life available South from an imaginary line drawn from Palm Beach to Sarasota, Florida.

Galston, Arthur W. The Green Plant. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1968.

10. p. 76 - # 1 - 3, 5 - 8, 12, 14 - 22

11. p. 98 - # 1 - 3, 6 - 9, 10 - 11, 15 - 23

12. P. 77 - # 14 - 22

13. p. 519 # 1 - 8

14. p. 518 # 1 - 5

15. p. 470 # 1 - 4

16. p. 474 # 7

Biological Sciences Curriculum Study. Biological Science - Molecules to Man. Boston: Houghton-Mifflin Co., 1968.

17. p. 306 # 1 - 7

18. p. 337 # 1 - 10

19. p. 338 # 22, 24, 29, 32

20. p. 311 # 1 - 8

21. p. 348 # 1-6

22. p. 370 # 7, 16, 20 - 21

23. p. 635 # 1 - 3

24. p. 651 # 6

Biological Sciences Curriculum Study. Biological Sciences An Inquiry into Life. New York: Harcourt, Brace and World, Inc., 1968.

25. p. 253 # 3, 4, 6

26. p. 278 # 3

27. p. 326 # 1, 2, 3, 6, 7, 10

28. p. 253 # 2, 5

29. p. 316 # 4

Biological Sciences Curriculum Study. High School Biology: BSCS Green Version. Chicago: Rand McNally & Co., 1968.

30. p. 474 # 1, 5, 8

31. p. 475 # 18 - 19

32. p. 184 # 12, 14, 16

33. p. 278 # 1

34. p. 622 # 2, 11-13, 6 - 9, 11-13, 15

ADDITIONAL INNOVATIVE ACTIVITIES

Dorothy, Sister M. "Biology Puzzles and Puzzlers. Portland, Maine: J. Weston Walch, Box 1075, 1963.

1. p. 62 - 63 - Thallophytes
2. p. 64 - 65 - Bryophytes
3. p. 13 - Scramble #1
4. p. 14 - Scramble #2
5. p. 15 - Scramble #3

Biological Sciences Curriculum Study. Biological Science - Molecules to Man. Boston: Houghton-Mifflin Co., 1968.

6. Investigating variation in the number of chloroplasts per cell (S - 4, p. 214)
7. Investigating variation in the number of chloroplasts per cell (S - 5, p. 215)
8. Investigating transmission reflection and absorption of light (S - 6, p. 216)
9. Investigating a plant's ability to absorb phosphate through its leaves (S - 12, p. 221)

Teacher-directed activities

10. Make a scrapbook of green plants
11. Collection of specimens
12. Write poems and short stories
13. Prepare bulletin boards
14. Seminars
15. Field observations and notes
16. Making a garden

SUPPLEMENTARY REFERENCES


1. Morton, J. F. and Ledin, R. B. 400 Plants of South Florida. Coral Gables, Florida: Text House, 1952.

2. Grant, V. "The Fertilization of Flowers," Scientific American. June, 1951, Offprint #12.

3. White, P. R. "Plant Tissue Cultures," Scientific American. November, 1950.

4. Wigglesworth, V. B. "Metamorphosis and Differentiation", Scientific American, February 1959, Offprint #63.

5. Steward, F. C. "The Control of Growth in Plant Cells", Scientific American, October, 1963.

6. Galston, Arthur W. The Green Plant. New York: Prentice-Hall, Inc., 1968, pp. 56 - 63, 78 - 88.

7. Galston, Arthur W. The Green Plant. New York: Prentice-Hall, Inc., 1968, pp. 63 - 77, 88 - 98.

8. Morton, Julia. Wild Plants for Survival in South Florida. Miami, Florida: Hurrican House Publishers, Inc. , 1968, pp. 11, 20, 26, 65.

MASTER SHEET - THE GREEN PLANT

| Objectives | Laboratory Experiments | Student Texts | Demonstrations | Projects | Reports | Field Trips | Speakers | Films | Film Loops | Slides or Film-Strips | Transparencies | Suggested Discussion Questions | Additional Innovative Activities | Supplementary References |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 34- p265<br>4- p23<br>3- p17<br>14- p18<br>15- p20<br>64- p385<br>66- p397 | 1- p31<br>2-pp261-265<br>3- p378<br>4-pp38-53, 108-126 | | 1 | | | | 49<br>50<br>51 | | | 2 | | 12<br>13 | |
| 2 | 14- p18<br>15- p20<br>35- p270<br>42- p25<br>64- p385<br>66- p397 | 1- p31<br>2-pp267-272<br>3- p378<br>4-pp38-53, 108-126 | | 1 | 5 | | | 49<br>50<br>51 | 1<br>2 | | 1<br>3 | | 12<br>13 | |
| 3 | 43- p18<br>44- p89<br>45- p90<br>46- p92 | 1- p359<br>2-pp285-296<br>3-pp378, 443,157<br>4-pp244-251, 254-261 | | | 4 | 1<br>2<br>3<br>4<br>5 | 3<br>4<br>5 | 10<br>11 | | 10<br>12 | 13<br>14 | 1 25<br>2 26<br>3<br>4 | 10<br>11<br>15 | |
| 4 | 43- p85<br>44- p89<br>61- p179 | 3-pp172-175,177 178 472-474<br>4-pp254-256,261 762-766 | | 3 | 1<br>2<br>3 | | 6 | 1, 9,<br>2, 10<br>3, 11 | | | 13<br>14 | 30 33<br>31<br>32 | 1 5<br>2 11<br>3 15<br>4 | |
| 5 | 6- p139<br>23- p132<br>24- p133<br>25- p138<br>36- p342<br>47- p97<br>48- p104<br>49- p105<br>65- p388 | 1-pp359 403,511<br>2-pp341-347<br>3- p443<br>4-pp263-275 | | | | 1<br>2<br>3<br>4<br>5 | 3<br>4<br>5 | 48<br>49<br>35<br>47 | | | 2<br>3<br>4<br>5<br>8 | 6<br>7<br>8<br>9 | 16 | |
| 6 | 7- p143<br>34- p474<br>50- p102<br>51- p107<br>65- p388 | 1-pp359-403,511<br>2-pp464-480<br>3-pp386-443<br>4-pp296-308 | | | | 6 | | 48<br>49 | | 9<br>9<br>11 | 2<br>9 | | 16 | |
| 7 | 4- p27<br>5- p135<br>16- p60<br>17- p62<br>18- p66<br>19- p84<br>20- p87<br>28- p168<br>29- p170<br>30- p174<br>31- p187<br>32- p198<br>33- p203<br>52- p96<br>53- p98<br>54- p100<br>55- p101<br>56- p102<br>68- p450<br>69- p429<br>70- p439<br>78- p105<br>79- p109<br>80- p111<br>81- p137 | 1- p100<br>2-pp162-210<br>3- p426<br>4-pp279-295 | | | | | 1<br>3<br>6 | 52 | 3<br>4 | | | | 6<br>7<br>8<br>9<br>14 | |

MASTER SHEET - THE GREEN PLANT (con't)

| Objectives | Laboratory Experiments | Student Texts | Demonstrations | Projects | Reports | Field Trips | Speakers | Films | Film Loops | Slides or Film-Strips | Transparencies | Suggested Discussion Questions | Additional Innovative Activities | Supplementary References |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4- p27<br>5- p135 | | | | | | | | | | | | | |
| 8 | 16- p60<br>17- p62<br>18- p66<br>19- p84<br>20- p87<br>28- p168<br>29- p170<br>30- p174<br>31- p187<br>32- p198<br>33- p203<br>52- p96<br>53- p98<br>54- p100<br>55- p101<br>56- p102<br>68- p450<br>69- p429<br>70- p439<br>78- p105<br>79- p109<br>80- p111<br>81- p137 | 1- p100<br>2-pp162-210<br>3- p426<br>4-pp279-295 | | | | | 1<br>2<br>6 | 52<br>59 | 3<br>4 | | | | 6<br>7<br>8<br>9<br>14 | |
| | 4- p27<br>5- p135<br>16- p60 | | | | | | | | | | | | | |
| 9 | 17- p62<br>18- p66<br>19- p84<br>20- p87<br>28- p168<br>29- p170<br>30- p174<br>31- p187<br>32- p198<br>33- p203<br>52- p96<br>53- p98<br>54- p100<br>55- p101<br>56- p102<br>68- p450<br>69- p429<br>70- p439<br>78- p105<br>79- p109<br>80- p111<br>81- p137 | 1- p100<br>2-pp162-210<br>3- p426<br>4-pp279-295 | | | | | 1<br>3<br>6 | 52 | 3<br>4 | | | | 6<br>7<br>8<br>9<br>14 | |
| 10 | 6- p139<br>7- p143<br>21- p96<br>22- p99<br>37- p474<br>48- p104<br>49- p105<br>50- p102<br>51- p107<br>67- p448<br>77- p99 | 1-pp403, 511<br>2-pp464, 480<br>3-pp386, 443<br>4-pp296-308 | 3 | | 7 | | 3<br>6 | 48<br>49 | 4 | | 5<br>9 | | 16 | |
| 11 | 8- p90<br>10- p216<br>11- p220<br>12- p222<br>35- p270<br>45- p90<br>56- p94<br>57- p110<br>62- p582<br>72- p314 | 4-pp306-316, 246-251, 257-261<br>3-pp578-599<br>2-pp298-311<br>1-pp499-516 | | 4<br>5<br>6<br>7 | 16<br>18<br>19 | 6<br>7 | | 4<br>5<br>6<br>9<br>27<br>33<br>40 | 8<br>9 | 11 | 7<br>11<br>12<br>15 | 5 27<br>13 28<br>17 34<br>18<br>19<br>20 | 14 | |

MASTER SHEET - THE GREEN PLANT (con't)

| Objectives | Laboratory Experiments | Student Texts | Demonstrations | Projects | Reports | Field Trips | Speakers | Films | Film Loops | Slides or Film-Strips | Transparencies | Suggested Discussion Questions | Additional Innovative Activities | Supplementary References |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 8- p90<br>38- p306<br>63- p589 | 1-pp499-516<br>4-pp246-250,255-261,267-275,311-316<br>3-pp584-599<br>2-pp298-311 | | 8<br>9<br>10<br>11 | 17 | | | 5<br>6 | 9 | 7<br>8<br>9 | 15<br>16<br>17<br>18<br>20 | 18 28<br>19 29<br>27 34 | | 2 |
| 13 | 1- p81<br>27- p203<br>36- p342<br>39- p377<br>58- p117 | 4-pp316-320<br>2-pp340-348,358-365<br>1-pp511-518 | | 12<br>13<br>14<br>15 | 8<br>9<br>10 | | 1 | 7<br>8<br>12<br>14 | | | 19 | 10 22<br>14<br>21 | 15 | 3<br>4<br>5<br>6 |
| 14 | 2- p116<br>9- p149<br>13- p148<br>26- p37<br>46- p630<br>59- p119<br>60- p121<br>73- p285<br>74- p289<br>75- p291<br>76- p293<br>10- p216<br>11- p220<br>12- p222<br>13- p148 | 4-pp320-326<br>2-pp629-635<br>1-pp465-470 | 1<br>2 | 16<br>17<br>15 | 11<br>20<br>21<br>22<br>23<br>24<br>25<br>26 | | 3 | 20<br>21<br>24<br>25<br>38 | 5<br>6<br>7 | 13 | | 11<br>12<br>15<br>16<br>23<br>24<br>27 | 12<br>14 | 7 |
| 15 | 71- p3 | None | | | 13<br>14<br>15 | 1<br>2<br>3<br>4<br>8<br>9<br>10<br>11 | 2<br>3<br>4<br>5 | 15 | | 1<br>2<br>3<br>4<br>5<br>6 | | | 10<br>11<br>15<br>16 | 1<br>8 |

ED 063121

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AUTHORIZED COURSE OF INSTRUCTION FOR THE QUINMESTER PROGRAM

# PLANT LIFE IN THE BACKYARD

5311.12
5312.12
5313.12

SCIENCE

(Experimental)

DADE COUNTY PUBLIC SCHOOLS

DIVISION OF INSTRUCTION • 1971

# PLANT LIFE IN THE BACKYARD

5311.12
5312.12
5313.12

Science

(Experimental)

Written by David Z. Kleinman and Bernard H. Ropeik

For the
DIVISION OF INSTRUCTION
Dade County Public Schools
Miami, Florida
1971

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Miami, Florida 33135

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# PLANT LIFE IN THE BACKYARD

## COURSE DESCRIPTION

This course will introduce the student to the more familiar plants in South Florida. Emphasis will be placed on the economic value of South Florida plant life. The course also will delve into the concepts of photosynthesis and plant propagation as practiced in South Florida.

## ENROLLMENT GUIDELINES

The course is an elective, beginning course for anyone who is interested in the Flora of South Florida.

## STATE ADOPTED TEXTBOOKS

1. Brandwein, et al. Life its Forms and Changes. New York: Harcourt, Brace and World, Inc., 1968.
2. Biological Science Curriculum Study. High School Biology: BSCS Green Version, 2nd ed. Chicago: Rand McNally, 1968.
3. Biological Science Curriculum Study. Biological Science: Molecules to Man, 2nd ed. Houghton Mifflin, 1968.
4. Biological Science Curriculum Study. Biological Science: An Inquiry Into Life, 2nd ed. New York: Harcourt, Brance and World, Inc., 1968.
5. Frazier and Smith. The Biological Sciences. River Forest, Illinois: Laidlaw Brothers, 1969.
6. Oxenhorn and Idelson. Pathways in Science Biology. Vols. I, II, III. Globe Book Co., 1970.
7. Thurber and Kilburn. Exploring Life Science. Boston: Allyn and Bacon, Inc., 1966.

## PERFORMANCE OBJECTIVES

1. Given an assortment of South Florida plants the student will distinguish which are used by people for:
   a. Food
   b. Shelter
   c. Clothing
   d. Medicine
   e. Landscaping

2. The student will be able to describe the conditions necessary for photosynthesis.

3. Given several selected plants the student will describe the proper methods of care needed for optimum growth.

4. The student will be able to describe one method of sexual reproduction and three methods of asexual reproduction and name two types of plants best suited to each type. The student will be able to demonstrate these methods of plant propagation in the laboratory.

5. The student will be able to identify several South Florida trees, shrubs and vines and describe their economic value.

6. The student will identify several toxic plants and their harmless relatives.

7. The student will name several undesirable plant forms and discuss or demonstrate economical methods of removing them.

COURSE OUTLINE

I. Common Dade County Plants

A. Native

B. Exotic

C. Ornamental

D. Toxic

E. Food

II. Plant Requirements

A. Photosynthesis
1. Water
2. Light
3. Carbon dioxide

B. Nutrients
1. Organic fertilizer, composition
2. Chemical fertilizer, composition
3. Growth hormones

C. Soil
1. Type
2. Drainage

III. Plant Propagation

A. Sexual
1. Pollination
2. Cross pollination
3. Hybridization

B. Asexual
1. Cutting
2. Grafting
3. Air Layering
4. Budding

IV. Plant Economics

A. Economically important plants
1. Food producing plants
a. Leaves and stems
b. Fruits
c. Seeds
d. Roots

2. Landscaping plants
    a. Flowering plants
    b. Ornamental shrubery
    c. Trees

B. Problems in plant production
    1. Conditions for optimum growth
    2. Pests and their control
    3. Diseases
    4. Pollution
        a. Air
        b. Water

C. Plant pests
    1. Water Hyacinth
    2. Algae, fungi, and mildew

EXPERIMENTS

Biological Science Curriculum Study. Laboratory Guide, Biological Science: An Inquiry into Life, 2nd ed. New York: Harcourt Brace & World, 1968.

| | | |
|---|---|---|
| 1. | Cells of Living Plants | (Ex. 3-2 p. 25) |
| 2. | An Enzyme in Plant and Animal Tissue | (Ex. 5-1 p. 32) |
| 3. | Food Energy | (Ex. 5-2 p. 34) |
| 4. | Compounds of Living Organisms | (Ex. 5-3 p. 36) |
| 5. | Investigating Differences in Peas | (Ex. 8-3 p. 59) |
| 6. | Fungus Among Us | (Ex. 12-2 p. 83) |
| 7. | The Importance of Seeds | (Ex. 14-3 p. 94) |
| 8. | Leaf Structure and Function | (Ex. 15-2 p. 97) |
| 9. | The Pigment in a Leaf | (Ex. 15-3 p. 98) |
| 10. | A Simple Key to Flowering Plants | (Ex. 17-2 p. 111) |
| 11. | From Seed to Seedling | (Ex. 17-3 p. 117) |
| 12. | Plant Reactions to Environment | (Ex. 17-4 p. 119) |
| 13. | Regulation of Growth in Plants | (Ex. 17-5 p. 121) |

Otto, Towle, Crider. Biology Investigations. New York: Holt, Rinehart & Winston Inc., 1965.

| | | |
|---|---|---|
| 14. | Mushroom | (Ex. 19-3 p. 164) |
| 15. | Growth Stimulators | (Ex. 23-4 p. 199) |
| 16. | Mineral Requirements of Plants | (Ex. 23-5 p. 203) |
| 17. | The Fruit, A Matured Ovary | (Ex. 26-3 p. 229) |
| 18. | The Seed, a Matured Ovule | (Ex. 26-4 p. 231) |
| 19. | Seed Germination | (Ex. 26-5 p. 233) |

Green and Bodrowsky. Laboratory Investigations in Biology. Morristown, New Jersey: Silver Burdett, 1971.

| | | |
|---|---|---|
| 20. | The Structure and function of the flower | (Ex. 38 p. 163) |
| 21. | The Germination of Seeds | (Ex. 40 p. 171) |

Biological Science Curriculum Study. High School Biology, 2nd ed. Chicago: Rand McNally Inc., 1968.

| | | |
|---|---|---|
| 22. | Vegetative Reproduction | (Ex. 16.1 p. 582) |

Thurber and Kilburn. Exploring Life Science. Boston: Allyn and Bacon, Inc., 1966.
This is an excellent source giving over 25 experiments on the growth of plant and how plants make food. (pp. 337-400)

Bulletin 8F, Biology. Dade County Public Schools, 1968.
Many experiments on plants.

PROJECT I

The student will bring in examples of the following "Plants in the Backyard":

1. a monocot plant (any)
2. a dicot plant (any)
3. a catkin
4. an example of a rhizome
5. a parallel veined leaf
6. a net veined leaf
7. a palmately veined leaf
8. a simple leaf
9. a compound leaf
10. a plant which shows alternate leaf arrangement
11. a plant which shows opposite leaf arrangement
12. a plant which shows whorled leaf arrangement
13. an example of a South Florida angiosperm
14. an example of a South Florida gymnosperm
15. a stem which shows conducting tissue

PROJECT II "TOXIC PLANTS"

The student will make a notebook or poster of the following South Florida poisonous plants. For each plant listed, the student will give the following information:

A. Photograph or pencil sketch
B. Scientific name
C. Habitat
D. Toxic effect
E. Treatment

1. Lantana
2. Rosary Pea
3. Manchineel
4. Poison Ivy
5. Coral Sumac
6. Physic Nut
7. Poison Sumac
8. Oleander
9. Milk Bush
10. Cajeput Tree
11. Privet
12. Pokeweed
13. Poinsetta
14. Larkspur
15. Jimsonweed

REPORTS

1. Forest plants which are used in everyday living.

2. South Florida plants such as poinsetta, periwinkle and pencil cactus are poisonous. Explain why.

3. Select five ferns and five palms that are native to South Florida. Tell how these are of benefit to man.

4. Prepare a report that helps to explain the effects of excess water on garden plants such as peas, beans, and corn.

5. Why string beans, squash and tomatoes are considered fruits.

FIELD TRIPS

1. Fairchild Tropical Gardens-- 10901 Old Culter Road, Coral Gables
   Dr. Gillis 667-1651

2. Redland Fruit and Spice Park-- Redland Road, Homestead Florida
   247-5727

3. Matheson Hammock-- Old Cutler Road, Coral Gables, Florida
   666--979

4. Camp Owaissa Bauer Park-- 17001 S.W. 264 Street Homestead, Florida
   247-6016

5. Simpson Park-- 55 S.W. 17 Road
   377-5569

SPEAKERS

1. Tropical Audubon - Mrs. Flora O'Brien 4440 W. Flagler

2. Dade County Redland Fruit and Spice Park 24801 S.W. 187 Ave. Rt. 2-Homestead

3. Everglades National Park - Chief Naturalist 247-6211

AUDIO VISUAL

Materials Available From Lindsey Hopkins

FILMS

| | | | | |
|---|---|---|---|---|
| 1. | Adaptations in Plants | 15 min. | C | AV #1-11107 |
| 2. | Leaves | 10 min. | BW | AV #1-02262 |
| 3. | Color of Life, The | 24 min. | C | AV #1-30664 |
| 4. | Life of a Plant | 10 min. | C | AV #1-02269 |
| 5. | Living Traps | 10 min. | C | AV #1-02326 |
| 6. | Plant Growth | 10 min. | BW | AV #1-02273 |
| 7. | Flowers and Their Purpose | 15 min. | C | AV #1-11105 |
| 8. | Flowers at Work | 11 min. | BW | AV #1-02349 |
| 9. | Flying Seeds | 10 min. | BW | AV #1-02322 |
| 10. | Fruits of Plants, The | 12 min. | C | AV #1-11106 |
| 11. | Gift of Green, The | 20 min. | C | AV #1-11090 |
| 12. | Growth of Flowers | 11 min. | C | AV #1-02354 |
| 13. | Growth of Seeds | 14 min. | C | AV #1-11103 |
| 14. | Plants Obtain Food | 15 min. | C | AV #1-11100 |
| 15. | Reproduction in Plants | 14 min. | C | AV #1-11051 |
| 16. | Roots of Plants | 11 min. | C | AV #1-02320 |
| 17. | Seasonal Changes in Plants | 10 min. | C | AV #1-02331 |
| 18. | Seasonal Changes in Trees | 10 min. | C | AV #1-02343 |
| 19. | Seed Dispersal | 11 min. | BW | AV #1-02293 |
| 20. | Seed Germination | 14 min. | C | AV #1-11104 |

SLIDES

| | | | |
|---|---|---|---|
| 1. | Evergaldes National Park | 14 Slides | AV #5-20095 |
| 2. | Flowers Set 1 | 30 Slides | AV #5-20080 |
| 3. | Flowers Set 2 | 34 Slides | AV #5-20077 |
| 4. | Plants & Trees | 28 Slides | AV #1-20046 |
| 5. | Plants Set 1 | 25 Slides | AV #5-00013 |
| 6. | Trees | 29 Slides | AV #5-20078 |
| 7. | Trees and Flowering Plants | 30 Slides | AV #5-20001 |

TRANSPARENCIES

| | | | |
|---|---|---|---|
| 1. | Flower | C | AV #2-00088 |
| 2. | Angiosperm: Flower | C | AV #2-00082 |
| 3. | Angiosperm: Root | C | AV #2-00081 |
| 4. | Angiosperm: Stem | C | AV #2-00080 |
| 5. | Mitotic Cell Division | C | AV #2-00008 |
| 6. | Plant Structure | C | AV #2-00022 |
| 7. | Structure of the Flower | C | AV# 2-00001 |
| 8. | Structure of the Leaf | C | AV# 2-00170 |
| 9. | Structure of the Leaf | C | AV# 2-00004 |

FILM LOOPS

Available From Wards Natural Science Establishment
Rochester, New York

| | | |
|---|---|---|
| 1. | Plant Life | |
| | Fresh-water Algae | |
| | 73 W 1277 Standard 8mm | $15.50 |
| | 73 W 6385 Super-8 | $19.00 |
| 2. | Mushrooms | |
| | 73 W 1278 Standard 8mm | 13.50 |
| | 73 W 6386 Super-8 | 17.00 |
| 3. | Corn Growth and Pollination | |
| | 73 W 1279 Standard 8mm | 17.00 |
| | 73 W 6387 Super-8 | 20.50 |
| 4. | Flowers Opening | |
| | 73 W 1280 Standard 8mm | 17.00 |
| | 73 W 6388 Super-8 | 20.50 |
| 5. | Fruit Ripening | |
| | 73 W 1281 Standard 8mm | 15.00 |
| | 73 W 6389 Super-8 | 18.50 |
| 6. | Seed Dispersal | |
| | 73 W 1282 Standard 8mm | 15.00 |
| | 73 W 6390 Super-8 | 18.50 |
| 7. | Self-planting Seeds | |
| | 73 W 1283 Standard 8 mm | 17.00 |
| | 73 W 6391 Super-8 | 20.50 |
| 8. | Seeds Sprouting | |
| | 73 W 1284 Standard 8mm | 15.00 |
| | 73 W 6392 Super-8 | 18.50 |
| 9. | Climbing Vines | |
| | 73 W 1285 Standard 8mm | 15.00 |
| | 73 W 6393 Super-8 | 23.00 |
| 10. | Desert Flowers | |
| | 73 W 1287 Standard 8mm | 18.50 |
| | 73 W 6395 Super-8 | 22.00 |
| 11. | Pocket Garden for Germination Studies | |
| | 73 W 1705 3 min. 30 sec. | 18.50 |
| 12. | Seed Distribution and Germination | |
| | 73 W 0580 Standard 8mm | 17.50 |
| | 73 W 0585 Super-8 | 18.60 |

COLOR SLIDES

Available from: Wards Natural Science Establishment, Rochester, New York.

| | | |
|---|---|---|
| 1. | Tree Fruits | |
| | 171 W 3700 Set of 28 slides | 25.00 |
| | Individual slides, each | 1.00 |
| 2. | Wild Flowers of Spring | |
| | 171 W 4000 Set of 30 slides | 27.00 |
| | Individuals, each | 1.00 |
| 3. | Summer Wild Flowers of the Woods | |
| | 171 W 4100 Set of 30 slides | 27.00 |
| | Individuals, each | 1.00 |
| 4. | Summer Wild Flowers of Field and Meadow | |
| | 171 W 4200 Set of 50 slides | 45.00 |
| | Individuals, each | 1.00 |
| 5. | Summer Wild Flowers of Pond and Swamp | |
| | 171 W 4300 Set of 30 slides | 27.00 |
| | Individuals, each | 1.00 |

## BIO-PLASTIC MOUNTS

Available from: Wards Natural Science Establishment, Rochester, New York.

| | | |
|---|---|---|
| **FUNGI AND LICHENS** | | |
| 1. | Mushroom Types<br>56 W 1100 | 7.25 |
| 2. | Mushroom Development<br>56 W 1110 | 6.25 |
| 3. | Lichen Types<br>56 W 1900 | 5.25 |
| **GINKGO** | | |
| 4. | Ginkgo Life History<br>56 W 5200 | 6.75 |
| **INJURIOUS PLANTS** | | |
| 5. | Poison Ivy<br>56 W 6100 | 7.25 |
| 6. | Poison Oak<br>56 W 6110 | 7.25 |
| 7. | Common Ragweed<br>56 W 6150 | 5.25 |
| **FLOWERS, FRUITS, AND SEEDS** | | |
| 8. | Flower Anatomy<br>56 W 7000 | 15.25 |
| 9. | Fruit Types<br>56 W 7150 | 8.75 |
| **GERMINATION MATERIALS** | | |
| 10. | Lima Bean Germination<br>56 W 7540 | 12.50 |
| 11. | Corn Germination<br>56 W 7560 | 8.75 |
| 12. | Pea Germination<br>56 W 7570 | 9.50 |

## DISCUSSION QUESTIONS

1. Discuss the effect of temperature and soil conditions of plants that are found in the backyard.

2. Discuss the effects of exotic plants such as the Australian pine on native plants.

3. What is the effect of light on plant growth? Consider the light and photosynthetic relationship.

4. Discuss the benefits that can be had by knowing something about plant propagation.

5. How is plant life being affected by pollutants such as smoke, smog, and chemicals?

## ADDITIONAL INNOVATIVE ACTIVITIES

1. Students who are photographers or artistic can make a display of 10 or 15 edible plants found in Dade County.

2. Set up displays which demonstrate the following types of reproduction:

   1. cutting
   2. air layering
   3. budding
   4. grafting
   5. "planting the eye" of a tuber
   6. splitting a bulb

3. Develop a simple plant key for the South Florida Area-(The Botany Handbook for Florida has a good example: This booklet can be obtained from the Department of Agriculture in Homestead).

4. Demonstrate the value of rooting hormone by dripping six or eight Croton cuttings in Rootone or similar material and placing them in a potting soil. Place an equal number of undipped cuttings in potting soil. Place both groups of plants in sunlight, and water daily. At the end of five or six weeks check for root growth.

REFERENCES


1. Hanson, Herbert C. and Churchill, Ethan D. The Plant Community. New York: Reinhold Publishing Co., 1961.

2. Morholt, Evelyn et al. A Source Book of the Biological Sciences. New York: Harcourt, Brace & World, 1966.

3. Morton, Julia. Wild Plants for Survival in South Florida. Miami, Florida: Hurricane House Publisher, Inc., 1968.

4. Northern, Henry. Introduction to Plant Science. New York: The Ronald Press, 1953.

5. Odom, Eugene E. Fundamentals of Ecology. Philadelphia: W.B. Saunders and Co., 1959.

6. Stevens, William, Southern Seashores. New York: Holiday House, 1968.

7. Weier, Elliot; Robbins, W.; Stocking, Ralph. Botany: An Introduction to Plant Science. New York: John Wiley and Sons Inc., 1957.

8. Weisz, Paul B. and Fuller, Melvin S. The Science of Botany. New York: McGraw-Hill Book Co., Inc., 1962.

9. Went, Frits W. The Plants. Life Nature Library. New York: Time Life Books, 1963.

10. Wilson, Carl L. and Loomis, Walter E. Botany. New York: Holt Rinehart and Winston, 1962.

RESOURCES

I. Pamphlets and Periodicals available from
U. S. Department of Agriculture
2690 N.W. 7 Ave. or 18710 S.W. 208 Street.
Miami, Florida Homestead, Florida

| | | |
|---|---|---|
| 1. | Growing Flowering Plants | Bulletin # 114 |
| 2. | Hibiscus in Florida | Bulletin # 168-A |
| 3. | Home Propagation of Ornamental Trees and Shrubs | Bulletin # 80 |
| 4. | How to Grow Your Own Mango Tree | Circular # 342 |
| 5. | Hydroponic Culture of Vegetables | Circular # 192A |
| 6. | Plant Propagation | Bulletin # 1567 |
| 7. | Propagation of Shrubs and Trees | Bulletin # 178 |
| 8. | Selected Trees of Florida Homes | Bulletin # 182 |
| 9. | Selecting and Growing House Plants | Bulletin # 82 |
| 10. | Botany Handbook for Florida | Bulletin # 187 |
| 11. | Common Aquatic Weeds | Agriculture Handbook # 352 |
| 12. | Florida Weeds | Circular # 331 |
| 13. | Poisonous Plants Around the Home | Bulletin # 175B |

II. Golden Nature Series
Golden Press - New York

14. Everglades
15. Flowers
16. Non-flowering plants
17. Pond life
18. The Southeast
19. Trees

MASTER SHEET PLANT LIFE IN THE BACKYARD

| Objectives | Texts | Experiments | Speakers | Projects | Library Reports | Field Trips | Transparencies | Films | Film Loops | Discussion Questions | Slides | Additional Activities | Bio-Plastic Mounts | Resources |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 10 | 1 | 1 | 1,4,5 | 5 | | 1,11 | 1,2 | | 1-2<br>4-5 | 1 | 1-3<br>8-9 | 14,19 |
| 2 | 2Ch.13<br>3Ch.9-19<br>7pp.389-395 | 8,9 | | | | 3,4,5 | 1,8,9 | | | 3 | | 4 | | 3,5,6,19 |
| 3 | 1Ch.9<br>2Ch.12,13<br>3Ch.24<br>4Ch.14 | 12,13,15,16 | | | 4,5 | 1,2 | | | | 1 | | 4 | | 14,16,19, |
| 4 | 1pp.291-302<br>7pp.337-355<br>2Ch.16<br>3Ch.13<br>4Ch.17 | 22,21,11,7<br>17 | | | 4 | 1,2 | 2,5,7 | 12,13,15,14 | 6,7,12,3 | 4 | 1,2,5 | 2 | 10,11,12 | 6,3 |
| 5 | | 10 | 2,3 | 1 | 3 | 1,2 | 1,28,9 | | | 5 | 1,2,3,4,5,6,7 | 3 | 8 | 3,5,8 |
| 6 | | 10 | 1,2,3 | 2 | 2 | 1,2 | | | | | | 3 | 5,6,7 | 13,19 |
| 7 | 1pp.234-242 | 6 | 3 | 2 | 3 | 3,4 | | 1 | 2,9 | 2 | 4,5 | 3 | 5,6,7 | 10,11,14,19 |